User Manual

Single Phase Electronic Meter
For Active Energy

HXE12R

Version：V1.0　2013

Content

1. General

This manual is for single phase energy meter for active energy.

HXE12R electronic meter is developed and manufactured by Hexing.

It features in high accuracy, low power consumption and reliable stability and superior anti-tampering functions.

Main Features

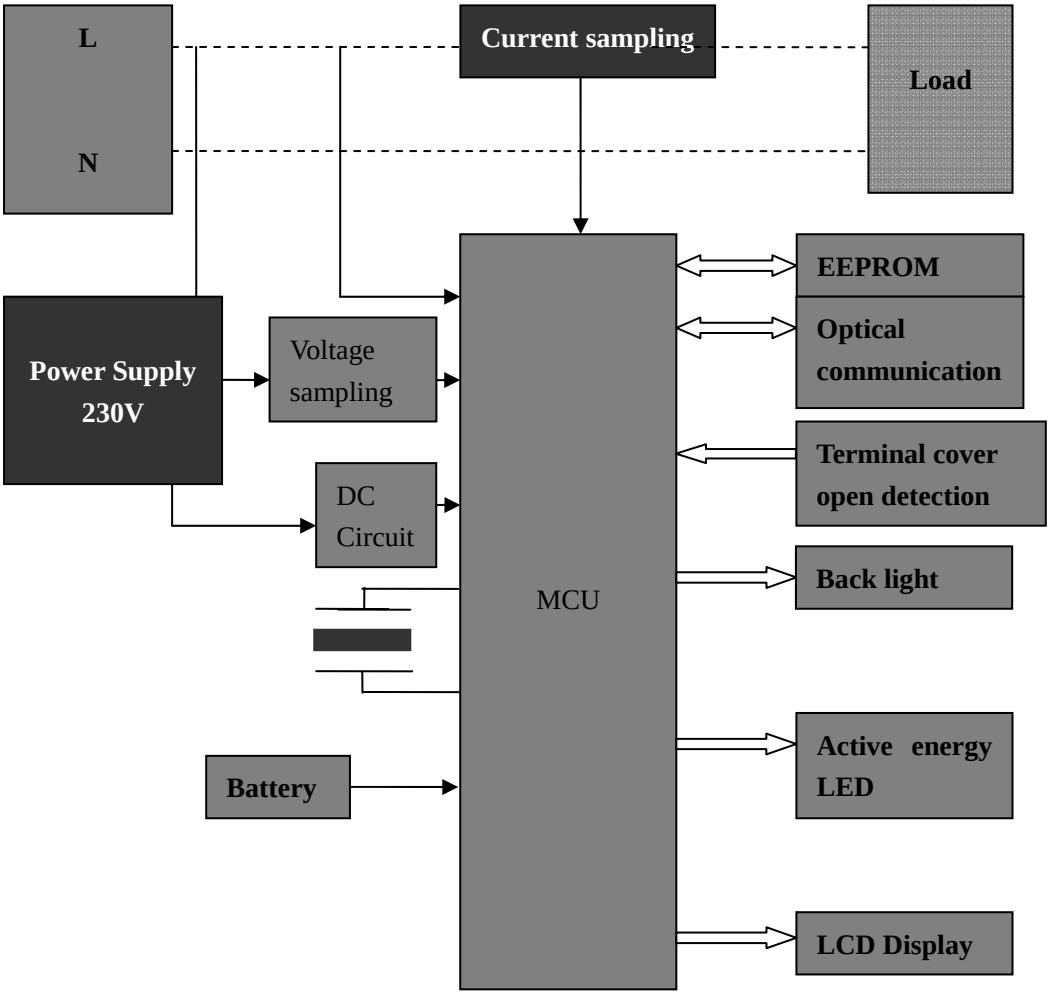
- LCD with 8 digits display format for energy record and meter status.
- LCD keeps display even when power supply is not available
- Display dual tarrif energy on both import active energy and export active energy
- Super capacity lithium battery used as back-up power supply
- Meter can detect reverse energy. The active tampering event will be indicated on LCD.
- Meter can continuously register energy accuracy under abnormal or tampering conditions.
- Meter is with self-diagnostic function and will display Error Code on LCD once an error occurred.
- Meter is equipped with non-resettable register.
- Specially designed buckle structure to avoid malicious open to the meter

2. Front Panel

3. Standard

Standard	Description	Version
IEC 62052-11	"Electricity metering equipment (a.c.) – General requirements, tests and test conditions – Part 11: Metering equipment "	2003
IEC 62053-21	"Electricity metering equipment (a.c.) –Particular requirements –Part 21:Static meters for active energy(classes 1 and 2) "	2003
IEC 62056-21	"Electricity metering – Data exchange for meter reading, tariff and load control – Part 21:Direct local data exchange"	2002

4. Working Principle



5. Measurement

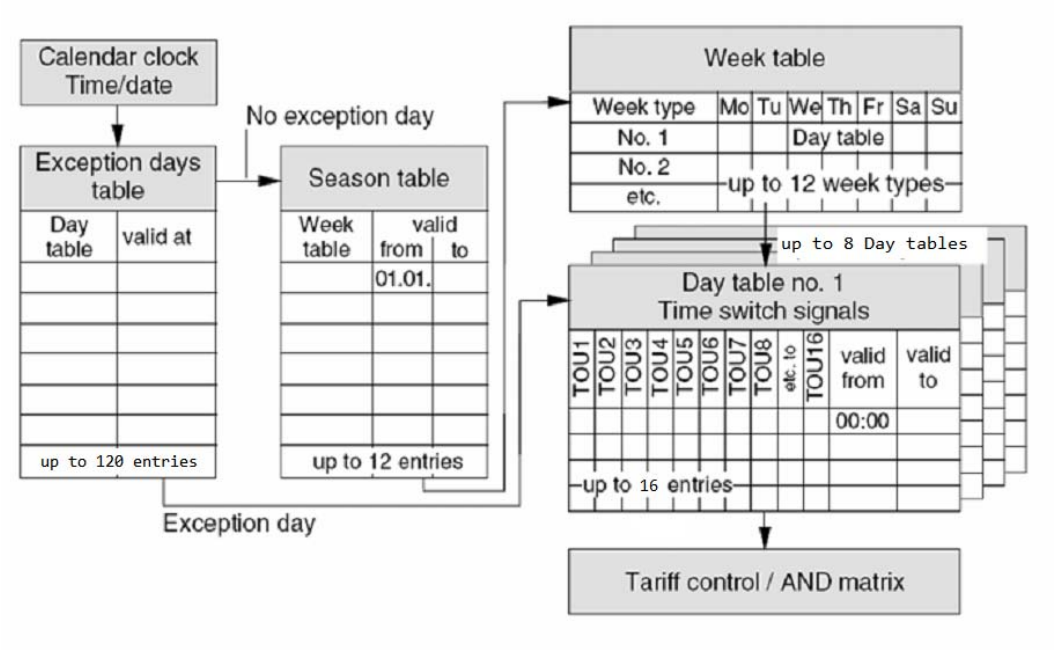
This meter is designed to measure two types of energy:

- Import active energy
- Reverse active energy

Dual tarrif measurement on both import active and export active. Import active and reactive measurement +A=+A -A=|-A|。

Store import and export energy data of 12 months.

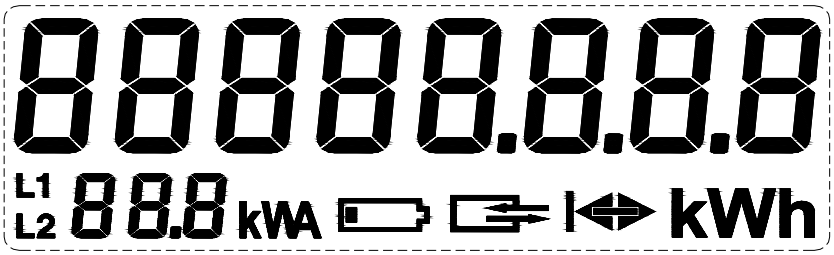
- Tarrif: 2 tarrif
- Tarrif schedule: 8 tarrif schedules, each have 16 time frames max.
- Week table：Max 12 week types, in each week type, it can be appointed with tarrif from Monday to Sunday.
- Season table：Max 12 season types. Each season can be appointed with week type that needs to be used in this season.
- Holiday： Max 120 holidays. Each holiday can be appointed with tarrif that needs to be used in this holiday. Among them, public holiday can be appointed as special holiday and annually periodic holidays.



6. LCD display

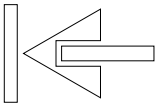
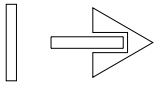
6.1 LCD with full segments

Below is LCD with full-segment display.



6.2 Display segments

Segments	Description

88888.8.8.8	Default 6+0 digit display, Integer and decimal digits are configurable, integer has 8 digits max, decimal has 3 digits max
88.8	Shows energy code
	Low battery indicator
L1 L2	represent current T1, T2
	Reverse energy indication
	Forward energy indication
	Communication status indication
kWh	Energy mnemonic symbol

7. Display mode

This meter is designed with two display modes:

- Normal scrolling display
- Power outage display

Normal scrolling display

Under this display mode, LCD shows import active and export active energy in each 8 seconds. Details as below:

Total import active： 000 T1+T2

T1 import：001　T1

T2 import：002　T2

Total export：010　T1+T2

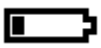
T1 export：011　T1

T2 export：012　T2

Power outage display

When power supply is not available, meter can display import active energy. Such display mode is realized by meter's back-up battery.

8. Back-up battery

This meter is equipped with high quality lithium back-up battery. Back-up battery is used to keep LCD display when power supply is not available. This battery is tested and installed inside the meter in the factory. For safety consideration and in order to keep the battery working in a good condition, meter should be installed where is far away from heat-emitting household compliance, such as stove. When the battery is in low voltage condition,  will be shown on LCD as indication.

9. LED Indication

LED is available for the meter. LED is on to indicate the meter is connected to power supply and it flashes to indicate energy consumption.

10. Self Diagnostic

10.1 Reverse Energy

This meter is designed with reverse energy detection functionality. Once the

reverse energy is detected, the symbol  will be shown on LCD. The reverse energy indication will disappear once the reverse energy event is removed.

Note: The power threshold of reverse energy is 5% of Un*Ib. When reverse energy exists, and the current power exceeds the power threshold, then this event will be detected as reverse energy.

10.2 Meter Malfunction

This meter is designed to be able to detect meter's parameter error and hardware error. Below is segment displayed on LCD indicating detected error.

Parameter error will be displayed such as E10 or E20 or E30 in decimal.

When parameter or hardware error is detected, error indication will be displayed on LCD. After error is removed and the meter is repowered, the indication will disappear automatically.

11. Installation

11.1 General Consideration

Meter should be installed correctly as it could determine meter's functionality and lifespan. Please follow the prescribed procedures carefully.

When selecting a suitable position for the meter, the following should be considered:

- General safety consideration in case of possible electric shock, fire, etc.
- For safety consideration, and avoid damage to the meter, install the meter where is far away from any water tap.
- Keep the energy meter away from a stove or any house hold compliance which produces heating exceeds meter's limited heat withstand.

11.2 Meter Handling

When handling this meter, please avoid the following actions:

- Avoid drop meter during the installation.
- Make sure meter is installed where is arid and ventilated.
- Do not attempt to open the meter cover.
- Do not add any additional or external voltages to the meter other than what is specified by the supplier.

11.3 Meter Connection

Please follow the instruction to arrange the wire connection:

a) Use copper cable as the lead-in wire to terminal block.

b) Screw out the wire-fasten screw so that the connection wires can be inserted into.

c) Remove the plastic cover of the connection wire long enough so that the wire-fasten screws can contact each connected wire.

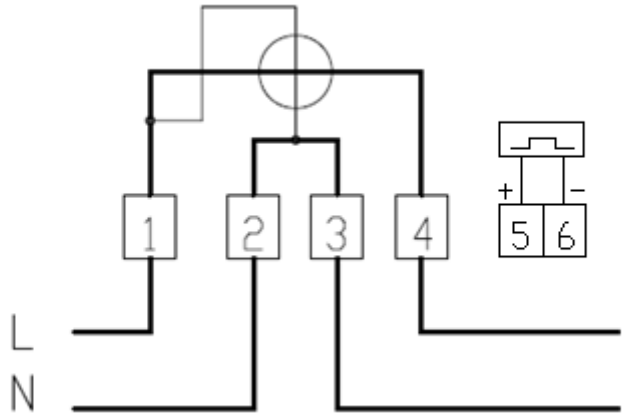
d) Screw the wire-fasten screws to fix the connection wires.

e) Pull the connected wires to check whether they are connected tightly.

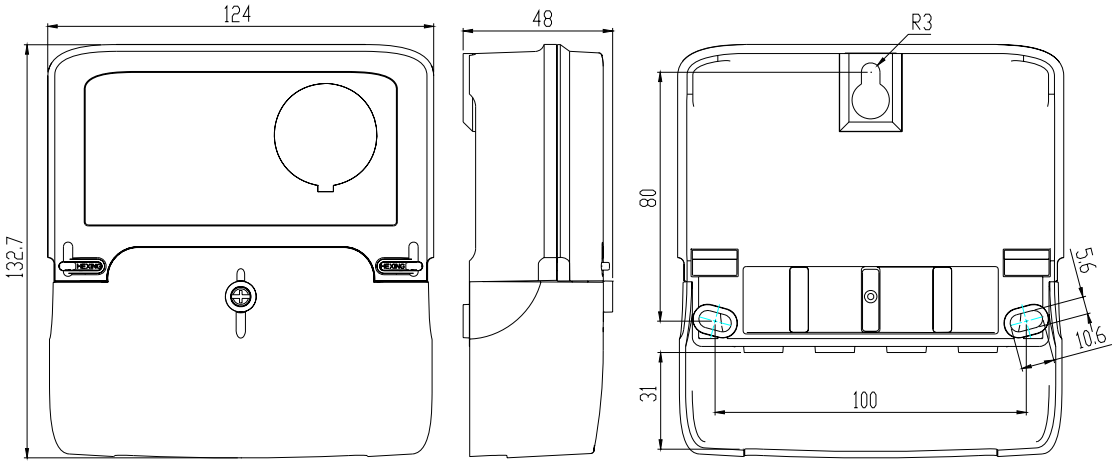
NOTE: The screws in the terminal block should be screwed down tightly to avoid burnt because of bad contact or thin lead-in wire.

Terminal wiring diagram is as below.

- **Connection Diagram:**



- **Meter Dimension**



Dimension：

- Width……124mm
- Height…… 132.7mm
- Depth…… 48mm

Installation Dimension：

- Width……110mm
- Height…… 80mm
- Depth…… 48mm

12. Parameters

Electrical	
Voltage	230V
Basic current	5A
Maximum current	100A
Starting current	0.004Ib
Frequency	50Hz
Burden in current circuit	<0.5VA
Burden in voltage circuit	<2W/10VA
Battery life	15years
Data retention	>15years
Meter life	15years
Impulse constant	1000imp/kWh

External influence	
Protection	IP54
Material for meter case compliance	ISO 75
Operating temperature	-25℃—55℃
Storage temperature	-40℃—70℃
Relative humidity	Up to 95%
Operating altitude	Up to 3500 m

Electromagnetic compliance	
Short time impulse	4kV
Surge voltage	4kV

Electrical insulation	
Insulation voltage	6kV
AC voltage	4kV

Accuracy	
Class	1.0
Standard Compliance	IEC62052-11, IEC62053-21, IEC 62056-21.

Mechanical parameters

Meter type	Direct connection HXE12R
Network type	1 Phase 2 Wire
Terminal configuration	L:N:N:L
Weight of Meter	0.4 kg (approx)
Dimension	124mm X 133mm X 48mm
Mounting	Front projection mounting
Sealing	Sealing provisions for terminal with one sealing screw
Terminal hole diameter	≥8mm
Terminal cover	Short length terminal cover
Meter Cover material	UV stable transparent PC
Meter Base material	Flame retardant glass fiber
Terminal Cover material	Flame retardant glass fiber
Terminal Box material	Flame retardant glass fiber

Technical parameters	
Measuring range	0—999999.99 kWh
Display mode	LCD
Communication port	Optical communication
Communication baud rate	Standby mode: 300bps, Communication mode: 4800bps.
Communication Protocals	IEC62056-21, Mode C

Initial baud rate for optical communication is 300 bps. After handshake, baud rate can reach to 4800 bps.

Communication interface：Meter is with either optical communication port.

By optical communication can realize meter firmware recording and meter reading.

Power-off metering: In power outage mode, meter reading can only be realized by LCD display.

Communication ID list:

ID	Data	Description	Unit	Note
Energy: Read only				
901F	XXXXXX.XX	current import active energy	kWh	
902F	XXXXXX.XX	current export active energy	kWh	

9200	XXXXXX.XX	import active energy of last month	kWh	
9201	XXXXXX.XX	export active energy of last month	kWh	
922E	ssmmHHDDMMYY	billing date of last month		
9240	XXXXXX.XX	import active energy of last 2 months	kWh	
9241	XXXXXX.XX	export active energy of last 2 months	kWh	
926E	ssmmHHDDMMYY	billing date of last 2 months		
9280	XXXXXX.XX	import active energy of last 3 months	kWh	
9281	XXXXXX.XX	export active energy of last 3 months	kWh	
92AE	ssmmHHDDMMYY	billing date of last 3 months		
92C0	XXXXXX.XX	import active energy of last 4 months	kWh	
92C1	XXXXXX.XX	export active energy of last 4 months	kWh	
92EE	ssmmHHDDMMYY	billing date of last 4 months		
9300	XXXXXX.XX	import active energy of last 5 months	kWh	
9301	XXXXXX.XX	export active energy of last 5 months	kWh	
932E	ssmmHHDDMMYY	billing date of last 5 months		
9340	XXXXXX.XX	import active energy of last 6 months	kWh	
9341	XXXXXX.XX	export active energy of last 6 months	kWh	
936E	ssmmHHDDMMYY	billing date of last 6 months		
9380	XXXXXX.XX	import active energy of last 7 months	kWh	
9381	XXXXXX.XX	export active energy of last 7 months	kWh	
93AE	ssmmHHDDMMYY	billing date of last 7 months		
93C0	XXXXXX.XX	import active energy of last 8 months	kWh	
93C1	XXXXXX.XX	export active energy of last 8 months	kWh	
93EE	ssmmHHDDMMYY	billing date of last 8 months		
9400	XXXXXX.XX	import active energy of last 9 months	kWh	
9401	XXXXXX.XX	export active energy of last 9 months	kWh	
942E	ssmmHHDDMMYY	billing date of last 9 months		
9440	XXXXXX.XX	import active energy of last 10 months	kWh	
9441	XXXXXX.XX	export active energy of last 10	kWh	

		months		
946E	ssmmHHDDMMYY	billing date of last 10 months		
9480	XXXXXX.XX	import active energy of last 11 months	kWh	
9481	XXXXXX.XX	export active energy of last 11 months	kWh	
94AE	ssmmHHDDMMYY	billing date of last 11 months		
94C0	XXXXXX.XX	import active energy of last 12 months	kWh	
94C1	XXXXXX.XX	export active energy of last 12 months	kWh	
94EE	ssmmHHDDMMYY	billing date of last 12 months		
Instantaneous Value: read only				
C400	XXXX.XX	Voltage	V	
C410	XXXX.XX	Current	A	
C420	XXX.XXX	total instantaneous active power consumption	kW	
C450	X.XXX	overall power factor		
C470	XX.XX	frequency	Hz	
Parameters: read & write				
C181	YYMMDDWWHHmmss	Date		
C182	NN	Demand interval	Min	
C189	NN	auto-scroll time	s	
C185	DDHH	billing time		
C01E	XXXXXXXX	code (only write)		
C004	XXXXXXXX	Meter number		
C005	XXXXXXXXXXXX	User identification		
C008	XXXXXXXXXXXX	Equipment number		
C160	NN	auto-scroll number		
C161	NNNN	1 to 8 of auto-scroll options		
C040	energy decimal	80、71、62、53、60 etc.		
C310	YYMMDDHHYYMMDDHH	5 DST table		
C311	YYMMDDHHYYMMDDHH	5 DST table		
C312	YYMMDDHHYYMMDDHH	5 DST table		
C313	YYMMDDHHYYMMDDHH	5 DST table		
C250	HHmmNN	First time table, 1 - 8 table		
C251	HHmmNN	First time table,9 - 16 table		
C254	HHmmNN	Second time table.1 - 8 table		
C255	HHmmNN	Second time table,9 - 16 table		
C258	HHmmNN	Third time table,1 - 8 table		
C259	HHmmNN	Third time table.9 - 16 table		
C25C	HHmmNN	Fourth time table,1 - 8 table		
C25D	HHmmNN	Fourth time table,9 - 16 table		

C260	HHmmNN	The fifth time table,1 - 8 table		
C261	HHmmNN	The fifth time table,9 - 16 table		
C264	HHmmNN	The sixth time table,1 - 8 table		
C265	HHmmNN	The sixth time table,9 - 16 table		
C268	HHmmNN	The seventh time table,1 - 8 table		
C269	HHmmNN	The seventh time table, 9 - 16 table		
C26C	HHmmNN	The eighth time table, 1 - 8 table		
C26D	HHmmNN	The eighth time table, 9 - 16 table		
C248	NNNNNNNNNNNNNN	Week table meter 1 - 3		
C249	NNNNNNNNNNNNNN	Week table meter 4 - 6		
C24A	NNNNNNNNNNNNNN	Week table meter 7 - 9		
C24B	NNNNNNNNNNNNNN	Week table meter 10 - 12		
C240	MMDDNN	Season 1 - 6		
C241	MMDDNN	Season 7 - 12		
C210	YYMMDDNN	special holiday date of 01-08 and meter number of day table		
C211	YYMMDDNN	special holiday date of 09-16 and meter number of day table		
C212	YYMMDDNN	special holiday date of 17-24 and meter number of day table		
C213	YYMMDDNN	special holiday date of 25-32 and meter number of day table		
C214	YYMMDDNN	special holiday date of 33-40 and meter number of day table		
C215	YYMMDDNN	special holiday date of 41-48 and meter number of day table		
C216	YYMMDDNN	special holiday date of 49-56 and meter number of day table		
C217	YYMMDDNN	special holiday date of 57-64 and meter number of day table		
C218	YYMMDDNN	special holiday date of 65-72 and meter number of day table		
C219	YYMMDDNN	special holiday date of 73-80 and meter number of day table		
C21A	YYMMDDNN	special holiday date of 81-88 and meter number of day table		
C21B	YYMMDDNN	special holiday date of 89-96 and meter number of day table		
C21C	YYMMDDNN	special holiday date of 97-104 and meter number of day table		

C21D	YYMMDDNN	special holiday date of 105-112 and meter number of day table		
C21E	YYMMDDNN	special holiday date of 113-120 and meter number of day table		
C201	NNNN	number of special holiday		
C202	NN	Number of season		
C203	NN	Number of week table		
C204	NN	number of day table		
C205	NNNNNNNNNNNN NNNNNNNNNNNN	12 day table		
Event : read only				
D310	NNNN……..	Event description, numbers +(event code + event status + time)*numbers		
D313	NNNN	Max event numbers (HEX code)		
D314	NNNN	Event record index (HEX code , read or write)		
D315	NNNN	Recorded event numbers (HEX code)		